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## Gastrointestinal

## Colonic angiodysplasia on CT colonography: case report and characteristic imaging findings

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## ABSTRACT

Gastrointestinal angiodysplasia represents the cause of 6% of lower gastrointestinal tract bleeding, particularly in the elderly. Because of the common presentation and age range of affected patients, often patients with occult or massive gastrointestinal bleedings are investigated with colonoscopy, in the suspect of colonic cancer. Other methods are capsule enteroscopy, angiography, double-contrast barium enema, computed tomography angiography, and radionuclide scanning. In this contribution, we describe a case of colonic angiodysplasia first suspected during computed tomography colonography performed after an incomplete colonoscopy in a patient with recent anemization. The purpose is to highlight the computed tomography colonography imaging characteristics of this rare finding during such examination performed due to suspected colon carcinoma as a complementary or substitutive method of colonoscopy.

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## Introduction

Gastrointestinal angiodysplasias, arteriovenous malformations, or angiomas are constituted by enlarged fragile blood vessels that tend to rupture in the gastrointestinal lumen. As a consequence, these lesions account for 6% of cases of lower

gastrointestinal hemorrhage [1], particularly in the elderly. The clinical presentation of colonic gastrointestinal bleeding may vary. It is asymptomatic in some patients and can present as an accidental finding during colonoscopy. However, hematochezia, melena, positive results on the fecal occult blood test, and iron deficiency anemia [2] are common occurrences in patients with colonic angiodysplasia. Due to the common

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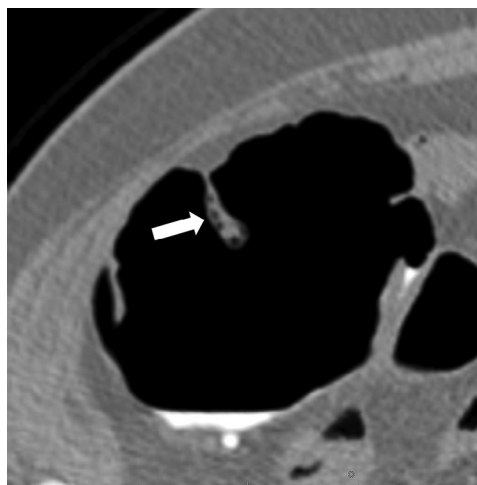
presentation and age range of affected subjects, in the suspect of a colonic cancer, patients with such symptoms are examined with colonoscopy.

Endoscopy is the main diagnostic tool in cases of gastrointestinal angiodysplasia. Capsule enteroscopy has been widely accepted as a useful method for the detection of gastrointestinal bleeding, particularly in the small bowel [3]. Angiography is also a common method for the diagnosis of angiodysplasia. Other applied diagnostic methods, above all for the study of the colon, are double-contrast barium enema, computed tomography (CT) angiography, and radionuclide scanning.

In this contribution, we describe a case of colonic angiodysplasia first suspected on a computed tomography colonography (CTC) performed after incomplete colonoscopy in a patient with recent anemization. The purpose is to highlight the CTC imaging characteristics of this kind of lesion, a rare but possible finding during a CTC performed in the case of a suspected colon carcinoma as complementary or substitutive method of colonoscopy.

## Case report

A consent for publication of the case was acquired. A 60-year-old man presented to our observation with recent onset of anemia and positive results on the fecal occult blood test. Previously, the man had undergone a colonoscopy that had been interrupted at the level of the right colon flexure because of the noncompliance of the patient. A CTC was then performed by a board-certified radiologist with 10 years' experience and a high level of expertise in this kind of technique. The patient underwent preprocedure preparation in the three 3 days before examination, consisting of the administration of a bowel-cleansing (polyethylene glycol) and low-fiber diet. In addition, a water-soluble iodinated contrast medium was administered orally for fecal and fluid tagging. CT images were obtained on an 8-row multidetector CT system (GE BrightSpeed Edge 8 Slice CT) in the prone and supine position. The scan range extended from the diaphragm to the inferior edge of the pubis in both positions. The data acquisition protocol was as follows: tube voltage 120 kV, tube current 155 mAs, slice thickness 2.5 mm. CT images were reconstructed at a 1.25 mm slice thickness and were transferred to an image workstation (GE Advantage Workstation). The images, including multiplanar reconstruction, volume rendering, dissected colon (virtual gross pathology), and virtual endoscopic, were generated. At the level of the colon cecum, CTC revealed the presence of a 14-mm-wide and 2-mm-thick lesion with a flat morphology (Figs. 1 and 2), located at 30 mm from the ileocecal valve. On unenhanced CT 2D images the lesion showed a nonhomogeneous density due to the presence of multiple thin serpiginous hypodensities and nonulcerated margins (Fig. 2). A capsule enteroscopy was then performed and detected multiple jejunoileal angiodysplasias and a voluminous cecal angiodysplasia, corresponding to the lesion described on CTC (Fig. 3). The patient did not undergo any intervention. The patient is currently in a good state of health and the anemia has been resolved.



**Fig. 1 – 60-year-old man with recent anemization and positive results on the fecal occult blood test. Axial 2D computed tomography colonography image at the level of the colon cecum shows a lesion with a flat morphology (white arrow).**

## Discussion

Gastrointestinal angiodysplasias are a common cause of gastrointestinal hemorrhage with a clinical manifestation ranging from iron deficiency anemia to positive occult bleeding and life-threatening hemorrhage.

Colonoscopy is the principal tool used for evaluating gastrointestinal bleeding when colonic cancer is suspected. As a consequence, this technique represents the major diagnostic tool for angiodysplastic lesions. In their study of 80 patients with colonic angiodysplasia, Richter et al. [4] demonstrated a sensitivity of colonoscopy of 68%, comparable with that of angiography and pathology, and a positive predictive value of 90%.

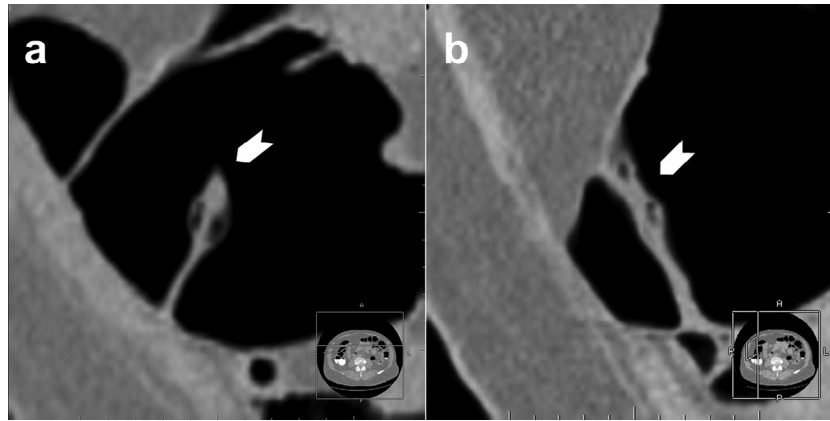
Colonic angiodysplasias are described in colonoscopy as small foci with scalloped or frondlike edges [1,5].

Angiography is also considered a useful diagnostic technique for angiodysplasias, with a reported sensitivity of up to 86% for the detection of gastrointestinal bleeding of the lower tract [6]. On an angiography, angiodysplasias appear as densely opacified and dilated early-filling veins.

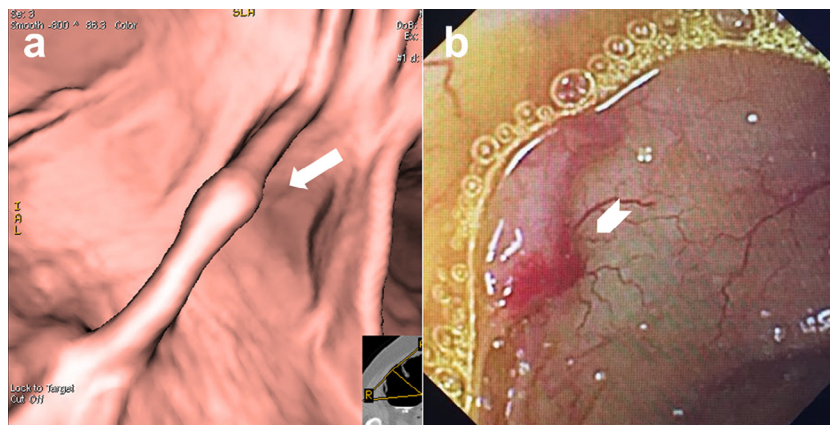
With regard to CT technique, the literature defines CT angiography as a minimally invasive tool with high sensitivity, specificity, and positive predictive values of 70%, 100%, and 100%, respectively [7], in detecting angiodysplasias. According to Junquera et al. [7], CT angiography findings indicative of colonic angiodysplasia include accumulation of vessels in the colonic wall, early-filling veins, and an enlarged supplying artery.

Patients with anemia or positive occult bleeding in the gastrointestinal tract usually undergo colonoscopy for suspected colonic cancer. CTC is considered a valid support to conventional colonoscopy in the diagnosis of colon carcinoma, particularly in patients who had incomplete colonoscopy or who refuse the invasive approach.

In the case reported, the patient, who suffered from recent anemization, underwent an incomplete colonoscopy, interrupted



**Fig. 2** – 60-year-old man with recent anemization and positive results on the fecal occult blood test. The coronal 2D computed tomography colonography (CTC) image (a) and sagittally reformatted 2D CTC image (b) better document the lesion (arrowheads). Note the nonhomogeneous density due to multiple thin serpiginous hypodensities.



**Fig. 3** – 60-year-old man with recent anemization and positive results on the fecal occult blood test. The 3D endoluminal computed tomography colonography CTC image (a) at the level of the colon cecum shows the flat lesion (white arrow). The capsule endoscopy image (b) at the same level shows a flat and nonulcerated lesion with internal engorged and congested vascular structures interpreted as colonic angiodysplasia (arrowhead).

at the level of hepatic flexure, because of inadequate bowel preparation and the patient's refusal to proceed. A CTC was thus performed and revealed a flat lesion at the level of the cecum. Some papers focused on the sensitivity of CTC have defined a lesion as being flat when the height was less than half the lesion diameter [8–11]. In patients with colorectal neoplasms, flat lesions and laterally spreading tumors are considered relatively common, with an incidence of approximately 10% in patients with advanced cancer [12,13]. It has been suggested that CTC and colonoscopy should be considered equivalent in terms of sensitivity in colorectal cancer detection [14].

Although angiodysplasias are a frequent occurrence in the colonic gastrointestinal tract, to the best of our knowledge there are no papers in the literature reporting CTC findings of colonic angiodysplasias.

The flat lesion detected showed, at CTC, a nonhomogeneous density due to the presence of multiple thin serpiginous hypodensities, with nonulcerated margins (Figs. 1 and 2). Although a morphological description of cancerous and precancerous flat lesions on nonenhanced 2D CT images is not

reported in the literature, personal experience suggests that these kinds of lesions show homogeneous densities, often with ulcerated margins [15]. Thus, for the dishomogeneous density with serpiginous hypodensities, the lesion was interpreted by the radiologist as suspicious of colonic angiodysplasia rather than a cancerous or precancerous flat lesion. The serpiginous hypodensities of the lesion were attributed possibly to engorged vessels. The successive capsule endoscopy confirmed the diagnosis.

To our knowledge, this is the first case in the literature where the presence of a colonic angiodysplasia was first suggested by a CTC and its appearance on this technique are described.

The angiodysplasia presented CT characteristics different from those of cancerous lesions, providing the basis for a differential diagnosis. This evidence suggests that when a flat lesion with nonhomogeneous density and internal serpiginous hypodensities is detected on CTC, the presence of an angiodysplasia should be suspected.

In conclusion, this uncommon diagnosis found on CTC highlights the importance of familiarity with features of colonic

angiodysplasias using this imaging technique, which will aid correct interpretation and diagnosis.

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